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A BRIEF STUDY OUTLINING

THE ROAD NETWORK AND RAPID TRANSIT SYSTEM

TO SERVE MALTON AIRPORT IN THE YEAR 2,000

ASSUMING NO OTHER AIRPORT

PROVINCE OF ONTARIO

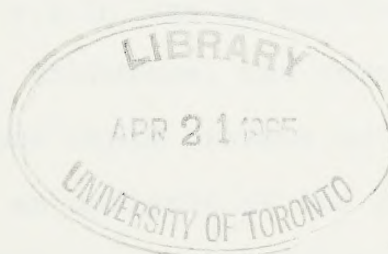
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INTRODUCTION:

Malton Airport now handles about 6 million passengers per year. If a new airport is built elsewhere in the region, Malton airport will handle about 25-30 million passengers per year by the year 2,000. However, if no new airport is constructed and Malton is expanded to serve the whole Toronto Region, then it is expected to handle around 66 million passengers per year by the year 2,000. The road pattern anticipated for the year 2,000 will not handle all the traffic generated by this volume. Therefore, the remaining passengers will have to rely on rapid transit to reach the airport.

In addition to this tremendous increase in passenger traffic, there will be an even more rapid increase in air freight. Only a proportion of this freight traffic will be able to use the road system, the remainder will have to arrive at the airport by train or other means. If all traffic wishing to gain access to the airport could come by road, by the year 2,000, the peak hour volume into the airport would be about 32,000 v.p.h., of this 20% of the traffic would be trucks. However, in fact only about 13,600 v.p.h. can be handled on the roads leading into the airport. Therefore, the remaining traffic, some 18,400 v.p.h., must use rapid transit or freight train.

This report presents an analysis of the road system as envisaged for the year 2,000, and examines the impact of the additional load on the transit system. It must be emphasized that the road pattern assumed and particularly the transit

plan visualized are really only an educated guess at what could be in operation by the year 2,000. The networks represent what it is conceivable to build and are completely untested at this time.

THE FUTURE ROAD NETWORK (Plate 1)

By the year 2,000 the entire freeway network around the airport is expected to be in operation.

Hwy. 407 will be complete across the north side of Toronto and will have been extended south of Brampton to join Hwy. 401 north of Streetsville. An expressway to Brampton and Bramalea in the vicinity of 2nd Line East will have been constructed. Hwy. 403 will run from Toronto to Hamilton and beyond. Hwy. 427 will run up to Steeles Avenue and the Belfield Expressway will have been open for many years.

Direct freeway connections will be required from the freeway system into the airport. The four freeway connections are shown on Plate 1 in red.

They are as follows:

1. On the east side of the airport the Belfield Expressway will lead directly into the airport.
2. Also on the east side, direct two lane ramps will lead from Hwy. 427 south.
3. On the south side direct two-lane ramps will lead from Hwy. 401 west. These will form a road which will run around the edge of the airport and join into the ramps from Hwy. 427

to form a six-lane facility.

4. On the west side a direct 4-lane freeway link will be provided from the Brampton Expressway into the Airport. For added flexibility, this link will also interchange with Dixie Road.

The connections on the east side will serve Metro Toronto and the area east of Metro. The connections to the south will serve traffic coming from Hwy. 401 west and from Hwy. 403. The connection on the west side will also serve traffic from Hwy. 403 and traffic from the Brampton, Bramalea Area. Access to the airport from the north side will be provided by arterial connection (shown in blue on plate 1). A four-lane access road with direct ramps will lead from Airport Road north serving the area around Malton Village. The other connection will be the continuation of Bramalea Road straight into the Airport. This will serve the Bramalea development and also traffic from Hwy. 407.

Selection of the entrance used will be based on three factors:

1. Drivers will wish to use the closest entrance.
2. Their destination within the Airport Complex will influence their choice.
3. Entrances which are less congested will become more attractive.

In order to obtain maximum flexibility, it is essential

that the airport has a really good internal traffic system, so that the best possible use can be made of all the entrances without further overloading the road system external to the airport.

The total capacity of these six entrances is as follows:

North Entrances (Bramalea and Airport Road)	4 x 600 pcph = 2400 pcph
West Entrance (From Brampton Expressway)	2 x 2000 pcph = 4000 pcph
South Entrance and East Entrance (From Hwy. 401 and Hwy. 427)	3 x 2000 pcph = 6000 pcph
Belfield Expressway	2 x 2000 pcph = 4000 pcph
	<hr/>
	16400 pcph

Because of the large amount of Air Freight, the truck percentage will be unusually high at around 20%. Therefore, the total possible capacity will be $16,400 \times 0.83 = \underline{13,600 \text{ vph}}$.

But the actual demand is 32,000 vph. Therefore, 18,400 vph must use other modes. This means in round figures that 38 million of the annual 66 million air passengers will be obliged to use rapid transit facilities. In addition, nearly 3,700 truckloads per day must be brought into the airport by alternate means. These large volumes will tend to load the transit system in two ways.

1. It will add traffic to the road network and thus force other users to seek other modes.
2. Since access to the airport will not be possible by road

for all, the remainder will use rapid transit.

The first factor will lead to the introduction of rapid transit facilities along highway routes earlier than presently anticipated.

Some examples of the effect of this are as follows:

<u>Location</u>	<u>No. of Lanes</u>	<u>Reaches Capacity Without Airport by:</u>	<u>Reached Capacity With Airport by:</u>
Hwy. 401 south of the airport	16	1995	1986
Hwy. 403 - Base Line to Hwy. 401	12	1991	1984
Brampton Expressway	8	1997	1990

Assuming that these facilities are introduced when the freeways approach capacity this means that the need for such facilities will be advanced by some 7-9 years because of the full airport expansion.

METHODS OF ADAPTING THE FUTURE TRANSIT SYSTEM TO SERVE MALTON AIRPORT:

Two basic schemes have been considered to adapt the Rapid Transit System so as to serve the increased traffic to the airport.

Concept I serves the airport directly, whilst Concept II serves the airport indirectly by the use of Satellite terminals.

Concept I (Plate 2)

In this concept access to Malton Airport would be provided by planned routes of the normal public transit system. There would be no exclusive transit links for airport access only. The routes that would be used by passengers heading for Malton are shown on Plate 2.

Consequences of such a system would be as follows:

1. The priorities of various transit routes would change. Those shown on the map would be necessary earlier relative to the remaining transit routes not affected by the airport.
2. Some lines would require facilities with higher speed and capacity capabilities because of the increased load on the lines servicing the airport.
3. Some transit terminals might have to be considerably expanded to handle special airline requirements; baggage, ticketing etc.
4. Operating problems would exist due to the dual purpose use of the trains - i.e. normal rapid transit, and airport access.
5. The Province would have to pay for most of these facilities (with the exception perhaps of the enlarged terminals and higher capacity routes).
6. Because of the operational problems - and the fact that the modes would not be 100% oriented to Airline Passenger Service - the system would not be very attractive and hence not a great success.

Concept II (Plate 3)

In this concept, there would be several satellite terminals at strategic locations in and around the City. These terminals would have facilities for weighing baggage, ticketing and even perhaps customs and immigration officials. From these terminals the passengers would be carried by high speed direct links into the airport. An internal distribution system at Malton would then transport the passengers to their loading areas. There would have to be parking facilities at the satellite terminals, which would have to have good access by road and by rapid transit.

Tentative proposals for such stations are:

1. Hwy. 403 and Cawthra Road

This is well served by Road; - Hwy. 403 and Cawthra Road and by rapid transit - the extension of the Eglinton Subway. The direct connection to the airport could be provided up Hwy. 403 and the Brampton Expressway - where provision has been made for rapid transit in the median.

2. Downtown

Probably in or around Union Station. This will be well served by rapid transit. The high speed link would be provided along the line of the C.N. track to Malton.

3. Spadina and Finch

This is well served by road - Spadina and Hwy. 401, and by rapid transit; Spadina subway and hover train along the Hydro

right-of-way. The direct link to the Airport would also be provided along this right-of-way.

4. Malvern

This is served by Hwy. 401 and the Hover train in the Hydro right-of-way. The high speed link trains from Malvern could also stop at Spadina and Finch to pick up airline passengers.

5. There would also be terminals of lesser importance in Hamilton, Guelph, Barrie and Oshawa; these would probably be best served by bus links into the nearest main terminal.

6. A terminal would also be required at Malton itself.

The implications of this system are as follows:

1. The priorities of the various routes would again change. More emphasis being placed on those routes serving as the high speed non-stop links to the airport.

2. The system would be convenient since people would have less distance to travel to reach a terminal.

3. The system would tend to make fuller use of the overall transit system since all the activity would no longer be focused to one point.

4. The system could be well staged. Concept (1) could be the first stage and then additional terminals could be added as required.

5. The Federal Government would pay for all or part of the cost of the Terminals and the exclusive airport transit service.

CONCLUSIONS:

1. The Road System

The road system as presently planned cannot be further expanded to absorb the additional load from the airport. This is principally because many of the roads are already planned as multilane highways (up to 16 lanes) and it is simply not practical to add further lanes. This means that the airport traffic will make these roads reach capacity earlier than anticipated.

2. The Transit System

The two concepts outlined above both provide service to the airport.

There is no doubt, however, that concept II provides the more attractive service, but at far greater cost. The increase in cost of Concept I is considered to be negligible, whereas the increase in cost of Concept II is very significant. However, in the long run, Concept I would tend to break-down earlier than Concept II since all the rapid-transit activity would be focused towards the one point. This would ultimately lead to extensive improvements to the lines shown on Plate 2, which could be more costly than those required for Concept II. A break-down of the increase in cost of Concept I & II in 1980, and in the year 2,000 is given in the appendix. These costs have been provided by the Transportation Systems Office.

APPENDIX:

CONCEPT I: Present Airport Expansion with Public Transit
 System

Assumptions -

1. Toronto International Airport expansion.
2. Public transit service to be provided by the regional transit system.
3. T.T.C. subway extensions.
4. No incremental costs over the regional transit system.

Stage 1 - 1980

Major Components:

1. Tracked air cushion vehicle (TACV) from Toronto (Union) Brampton.
2. Express bus links from terminals to the airport.
3. Subway extensions (Bloor, Spadina, Yonge).

Stage 2 - Ultimate Toronto Centred Region Transit Concept

Costs - no incremental costs (assumption).

CONCEPT II: Multi-Terminal Concept

Assumptions -

1. Expansion of Toronto International Airport.
2. Decentralization of air service by regional collection/distribution terminals.
3. Public Transit as in the Toronto Centred Region Transit Concept.
4. Additional transit service to satisfy the requirements of air passengers.
5. Cost estimates for only the facilities needed to satisfy air passenger requirements, in addition to the Toronto Centred Region Transit Concept.

Stage 1 - 1980

Major components -

1. Exclusive airport access by TACV from downtown Toronto via CNR's north-west rail right-of-way.

Stage 2 - 2000

Major components -

1. Regional collection/distribution terminals at
 - (i) Union Station
 - (ii) Bloor Street and Highway 27
 - (iii) Malvern in Scarborough near Highway 401 and the Hydro right-of-way.
 - (iv) Spadina and Highway 401, probably in the area of the armed forces air base.
 - (v) Yonge Street and the Hydro R-O-W.
 - (vi) Hamilton
 - (vii) Guelph
 - (viii) Barrie
 - (ix) Oshawa.
2. Exclusive airport access by TACV from the Malvern Terminal via the Hydro R-O-W in northern Metropolitan Toronto.
3. Exclusive airport access by TACV from the lakeshore, probably via the median in the rebuilt Highway 27.
4. Connection of the Spadina Rapid Transit line from Wilson Avenue to the TACV in the Hydro R-O-W.
5. Express bus links from regional terminals to the airport.
6. Feeder bus service to the TACV lines where necessary.

COSTS




<u>Route</u>	<u>Mode</u>	<u>Cost/mile</u>	<u>Mileage</u>	<u>Cost</u>	
				<u>Low</u>	<u>High</u>
<u>Stage 1</u>					
Toronto-Airport	TACV Express bus	\$ 5-10M	14	\$ 70M	\$ 140M NE*
<u>Stage 2</u>					
Hwy. 27	TACV	5-10M	8	40M	80M
North Metro	TACV	5-10M	19	95M	190M
Spadina	Rapid Transit	10-15M	3	30M	45M
	Express Bus				NE*
	Feeder Bus				NE*
	Terminals				NE*
* NE - No Estimate				<u>\$235M</u>	<u>\$455M</u>

PLATES:

ROAD NETWORK SERVING MALTON AIRPORT IN THE YEAR 2000

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FEET

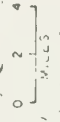
LEGEND

-  EXPRESSWAYS
-  ARTERIAL
-  INTERCHANGES

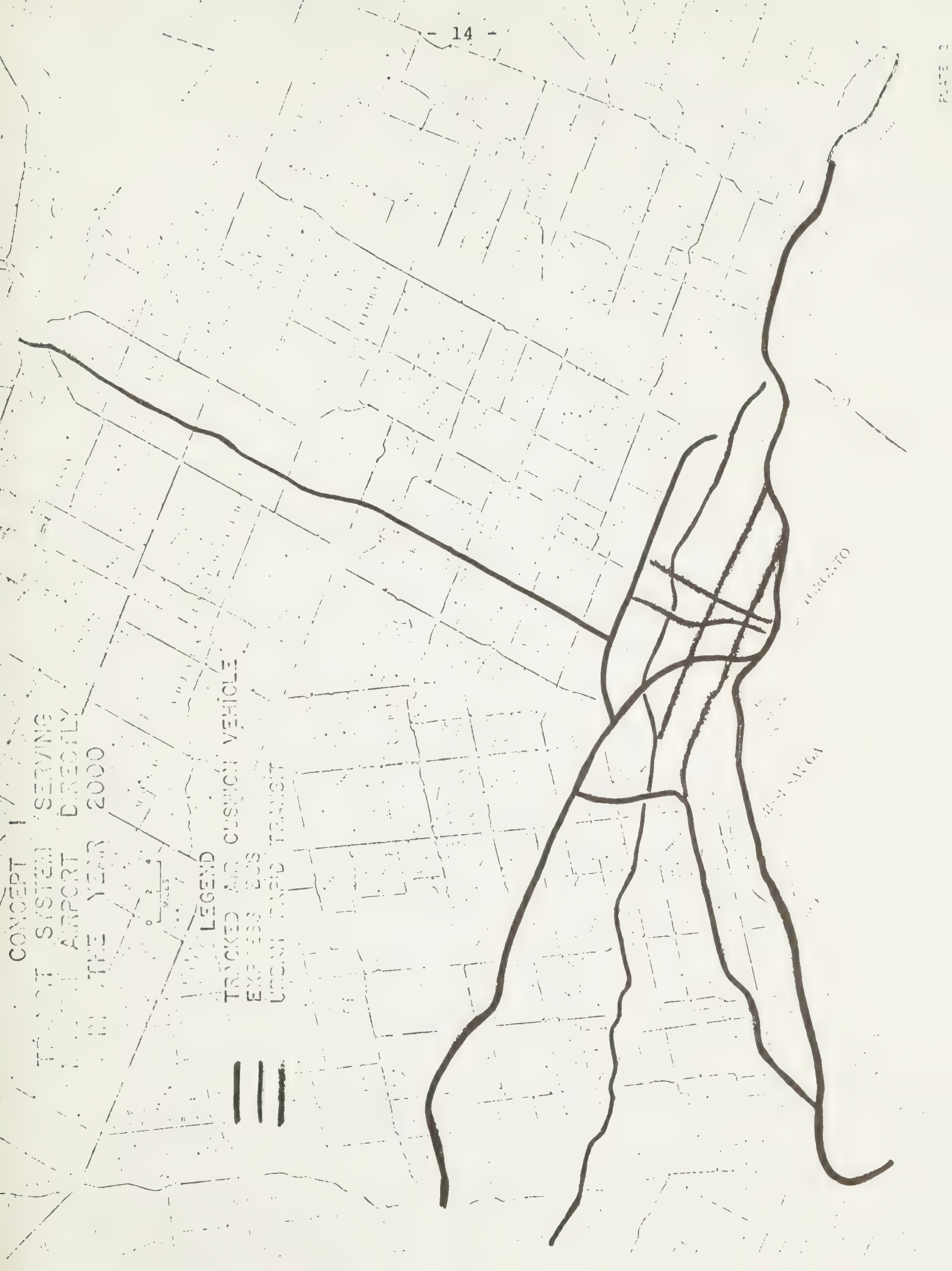


PLATE

CONCEPT
TRANSIT SYSTEM SERVING
AIRPORT DIRECTLY
IN THE YEAR 2000



- LEGEND
- THICKED AIR CUSHION VEHICLE
 - EXPRESS BUS
 - URBAN RAPID TRANSIT

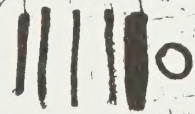


CONCEPT II

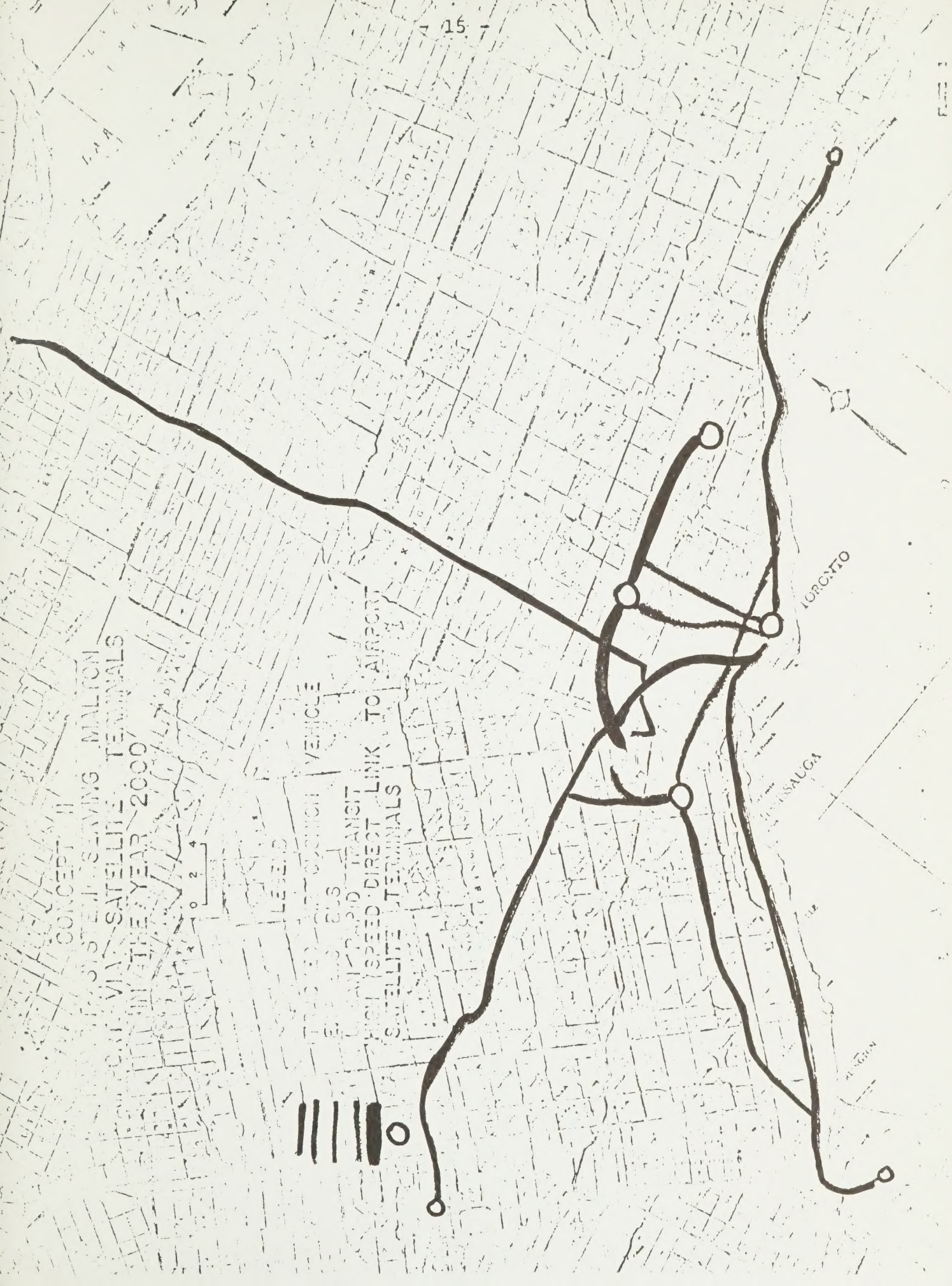
FASTEST ELIMINATING MALTON
AIRPORT VIA SATELLITE
TERMINALS
BY THE YEAR 2000

0 2 4

LEGEND



THICK LINE - AIRCRAFT VEHICLE
THIN LINE - BUS
CIRCLE WITH DOT - TRANSIT
LINK (SPEED DIRECT LINK TO AIRPORT)
SATELLITE TERMINALS



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